

Amendment to the Claims

1 – 20. (Cancelled)

21. (Previously Presented) A method for detecting a data pattern in an input signal, said method comprising the steps of:

- a) matching the data pattern to a known sync pattern using waveform correlation;
- b) shifting the known sync pattern by a timing offset determined from the waveform correlation to create a shifted sync pattern; and

- c) utilizing the shifted sync pattern to further process the input signal; and
- d) generating synchronization information;

wherein the synchronization information comprises a modulation index;

wherein the step of generating synchronization information comprises the steps of:

calculating a modulation index (g) of the input signal using the shifted sync signal, as

$$g = \frac{\sum_i r_i * t_i - \frac{1}{N} \sum_i r_i \sum_i t_i}{\sum_i t_i^2 - \frac{1}{N} \left(\sum_i t_i^2 \right)} ; \text{ and}$$

calculating a frequency offset (dc) of the input signal using the shifted sync signal, as

$$dc = \frac{1}{N} \left(\sum_i r_i - g \sum_i t_i \right),$$

where r_i denotes digital samples of the data pattern, t_i denotes digital samples of the shifted sync signal, and $i = 1, 2, \dots, N$ are indexes of the samples of the input signal and the shifted sync signal.

22. (Cancelled)

23. (Previously Presented) The method of claim 21, further comprising the steps of:

calculating an amount of noise (E) present in the received signal, using the shifted sync signal, as $E = \sum_i (r_i - gt_i - dc)^2$;

comparing the calculated noise E to a threshold T to determine whether or not the received signal samples r_i represent a valid sync signal; and

performing step c) only if it is determined that the received signal samples represent a valid sync signal.

24. (Previously Presented) The method of claim 21, wherein step b) comprises shifting sampling points within said known sync pattern by the timing offset determined from the waveform correlation to create the shifted sync pattern.

25 - 28. (Cancelled)

29. (Previously Presented) The method of claim 21 wherein the synchronization information comprises a frequency offset.